NOAA's Coastal Assessment and Data Synthesis System

Population, Population Density, and Population Change for 1970, 1980, and 1990

Dataset Description

The national coastal population dataset consists of population statistics developed by the U.S. Bureau of the Census with additional statistics calculated from this same source information by the Special Projects Office (SPO) of the National Ocean Service (NOS) of NOAA. The Census Bureau provided census count and current estimates of the number of inhabitants of the Nation, regions, States, cities, counties, and other areas (not including Hawaii and Alaska). The types of population statistics contained in this dataset include: population (number of persons); population change (number and percent); population density (number of persons per square mile) and density change (number and percent).

The data are available for four distinct spatial aggregations as outlined below. To view the data dictionary of each dataset, click on the links below or refer to NOAA's Coastal Assessment and Data Synthesis System (http://cads.nos.noaa.gov).

1) Coastal Watersheds (from NOAA's Coastal Assessment Framework),
(http://spo.nos.noaa.gov/projects/cads/data_references/population/pop_eda_h_dict.html)
2) Hydrologic Cataloging Units (8-digit sub-watersheds from the U.S. Geological Survey and a building block of NOAA's CAF),
(http://spo.nos.noaa.gov/projects/cads/data_references/population/pop_huc_h_dict.html)
3) Counties, and
(http://spo.nos.noaa.gov/projects/cads/data_references/population/pop_cnty_h_dict.html)
4) States (aggregated from Counties).
(http://spo.nos.noaa.gov/projects/cads/data_references/population/pop_st_h_dict.html)

Source(s) of Information

1970, 1980, and 1990 census block estimates were provided by:
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Data Processing

Geo-referenced points (centroids) for 1980 population estimates were reported by geographic county sub-divisions known as census tracts. The centroid point coverage was created from the 1980 Master Area Reference File (MARF) of the U.S. Census Bureau. The size of census tracts varies widely, depending on the density of settlement. They are designed to be homogeneous with respect to population characteristics, economic status, and living conditions and do not cross county boundaries. Census tracts usually contain between 2,500 and 8,000 people, and generally average approximately 4,000 people. Population at each census tract centroid for 1980 was estimated by proportionally adjusting this information to the change in county population. If, for example, the county population increased 7 percent between 1970 and 1980, then all points in the county were increased 7 percent (see source web site for more information). Census tracts

(1970, 1980) for each state were concatenated, yielding one national population centroid file that was imported to ArcView GIS 3.0. The census tract centroids were assigned watershed attributes through a spatial overlay operation with NOAA's Coastal Assessment Framework (CAF) of watershed boundaries. These data were then summarized by NOAA's Unique Code, HUC, and Watershed (EDA, CDA, FDA). County level 1970 and 1980 population estimates were obtained by summarizing population data by the existent 5-digit FIPS code associated with each census tract centroid.

Geo-referenced points (centroids) for 1990 population estimates were reported by geographic county subdivisions known as census blocks. Blocks are small areas bounded on all sides both by visible physical features such as streets, roads, streams, and railroad tracks; and by invisible political boundaries, such as city, town, township, and county limits, property lines, and short fictional extensions of streets and roads. The population data organized by state was extracted from CD-ROMs containing Public Law 94-171 population and housing unit counts using the EXTRACT program provided on the disks. This is a menu-driven program that allows the user to select the geographic level of detail and various fields from the database. Census blocks (1990) for each state were concatenated, yielding one national population centroid file that was imported to ArcView GIS 3.0. Estimates were assigned watershed attributes through a spatial overlay operation with NOAA's Coastal Assessment Framework (CAF) of watershed boundaries. These data were then summarized by NOAA's Unique Code, HUC and Watershed (EDA, CDA, FDA). County level 1990 population estimates were obtained by summarizing population data by the existent 5-digit FIPS code associated with each census block centroid.

Additional population statistics were calculated from the source Census data by SPO. These statistics include population density by spatial unit for each time period. The area of each spatial unit represented was derived from ArcInfo geographic coverages and used to calculate population density as follows:

$$\text{Population} / \text{Area} = \text{population density (persons per square mile)}$$

Population density change (number and percent) values were developed to analyze trends from 1970 to 1980, 1970 to 1990, and 1980 to 1990 and calculated as follows:

$$\text{Popdens}_{t2} - \text{Popdens}_{t1} = \text{population density change}$$

$$((\text{Popdens}_{t2} - \text{Popdens}_{t1}) / \text{Popdens}_{t1}) \times 100 = \text{population density percent change}$$

Population change (number and percent) values were developed to analyze trends from 1970 to 1980, 1970 to 1990, and 1980 to 1990 and calculated as follows:

$$\text{Pop}_{t2} - \text{Pop}_{t1} = \text{population change}$$

$$((\text{Pop}_{t2} - \text{Pop}_{t1}) / \text{Pop}_{t1}) \times 100 = \text{population percent change}$$

For instances where Pop_{t1} was zero (0) and therefore population change was indeterminable, $(\text{Pop}_{t2} - \text{Pop}_{t1})$ was divided by 0.0001. This results in an exaggerated (high) value.
For example, if Population 1990 was 1,234 and Population 1980 was 0, then
Population Change 1980-1990 = ((1,234) - 0) / 0.0001 = 12,340,000

Contact(s) for Data Processing

For expert assistance with the data processing techniques used in developing this data, please contact;

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Quality Control

The Census block 1990 population estimates summarized by county from USGS were checked for accuracy against the Census CD-ROM block group 1990 population estimates that was also summarized by county. The results found small differences in the few counties shown below:

POP90   = Persons in County (data by census blocks as provided by USGS)
POP90_1 = Persons in County (data by census block groups as provided by U.S. Census Bureau)

FIPS	POP90	POP90_1
02290	6,714	8,478
25023	433,812	435,276
26147	145,590	145,607
26163	2,110,972	2,111,687
48061	260,067	260,120
48141	587,392	591,610
48215	382,921	383,545

County-level population data was computed using a file with prorated values (population data in unique/county area). This county level data was compared with data in the original Census county datasets. The comparison provided confirmation of the accuracy of the areal proration coefficients used.

Citation

Population, Population Density, and Population Change (1970, 1980, 1990). Coastal Assessment and Data Synthesis (CA&DS) System, 1999. National Coastal Assessments (NCA) Branch, Special Projects Office (SPO), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA). Silver Spring, Maryland.

Applicable Digital Geographies

The data are associated to distinct spatial aggregations. Geographic Information System (GIS) digital geographies are available for associating these data to their appropriate spatial aggregations. The following GIS files apply to and should be used with these data during GIS processing. To download the data or an applicable digital geography, click on the links below.

Dataset Spatial Aggregation	Applicable GIS file(s)
Coastal Watersheds	ftp://sposerver.nos.noaa.gov/datasets/CADS/GIS_Files/ShapeFiles/caf/
Hydrologic Cataloging Units	ftp://sposerver.nos.noaa.gov/datasets/CADS/GIS_Files/ShapeFiles/caf/original_caf
Counties	ftp://sposerver.nos.noaa.gov/datasets/CADS/GIS_Files/ShapeFiles/counties
States	ftp://sposerver.nos.noaa.gov/datasets/CADS/GIS_Files/ShapeFiles/states

For Additional Information:

For additional information, refer to NOAA's Coastal Assessment and Data Synthesis (CA&DS) System, or contact;

The CA&DS team.
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